

REMARKSIN THE CLAIMS:

Applicants respectfully request the Examiner to cancel without prejudice original Claims 19 – 38, 60 – 63 and 67, and to enter amendments to Claims 1 – 18, 39, 41, 64, and 66, as shown below.

ORIGINAL CLAIM 1 IS AMENDED AS FOLLOWS:

In original line 1 of the claim, the words -- reaction mixture curable to form a -- are ADDED AFTER the word “A” and BEFORE the words “light-weight polyisocyanurate”; and the word “composition” AFTER the word “foam” and BEFORE the comma and word “comprising” is DELETED and REPLACED with the word -- structure -- . The change is made to properly characterize the invention as a foam structure that results from reacting the claimed constituent materials together. Support is found in paragraphs [0021], [0022], [0024], and [0028] – [0034] of the written description, and in step (d) of original Claim 19.

In original line 4 of the claim, the word -- and -- is ADDED AFTER the semicolon ending the clause. The change is made to correct the punctuation and syntax of the claim.

ORIGINAL CLAIM 2 IS AMENDED AS FOLLOWS:

In original line 1 of each claim, the word “composition” AFTER the words “light-weight polyisocyanurate foam” is DELETED and REPLACED with the word -- structure -- . The change is made to comport each claim with the amendment to Claim 1 and to properly characterize the invention as the foam structure that results from reacting the claimed constituent materials together. Support is found in paragraphs [0021], [0022], [0024], and [0028] – [0034] of the written description, and in step (d) of original Claim 19.

ORIGINAL CLAIM 3 IS AMENDED AS FOLLOWS:

In original line 1 of the claim, the word “composition” AFTER the words “light-weight polyisocyanurate foam” is DELETED and REPLACED with the word -- structure --

. The change is made to comport each claim with the amendment to Claim 1 and to properly characterize the invention as the foam structure that results from reacting the claimed constituent materials together. Support is found in paragraphs [0021], [0022], [0024], and [0028] – [0034] of the written description, and in step (d) of original Claim 19.

In original line 2 of the claim, the words “mixture of” AFTER the words “epoxide resin” and BEFORE the words “bisphenol A” are DELETED and REPLACED with the words -- resin formed by a condensation reaction between --. The change is made to properly characterize the resin used as the product of a reaction between constituent resins. Support is found in paragraph [0025] of the written specification.

ORIGINAL CLAIMS 4 – 18 ARE AMENDED AS FOLLOWS:

In original line 1 of each claim, the word “composition” AFTER the words “light-weight polyisocyanurate foam” is DELETED and REPLACED with the word -- structure --. The change is made to comport each claim with the amendment to Claim 1 and to properly characterize the invention as the foam structure that results from reacting the claimed constituent materials together. Support is found in paragraphs [0021], [0022], [0024], and [0028] – [0034] of the written description, and in step (d) of original Claim 19.

ORIGINAL CLAIMS 19 – 38 ARE WITHDRAWN AND CANCELED.

ORIGINAL CLAIM 39 IS AMENDED AS FOLLOWS:

In original line 13 of the claim, the word -- and -- is ADDED AFTER the semicolon ending the clause. The change is made to correct the punctuation and syntax of the claim.

In original lines 15-16 of the claim, the comma and words “, said post cured foam tool” are DELETED and REPLACED with the words -- capable of --. The change is made to better describe the invention. Support is found in line 1 of the Abstract and in TABLES 3 and 4 of the written description.

ORIGINAL CLAIM 40 IS UNCHANGED.

ORIGINAL CLAIM **41** IS AMENDED AS FOLLOWS:

In original line 1 of the claim, the word “comprising” AFTER the words “epoxide resin” and BEFORE the word “a mixture” is DELETED and REPLACED with the words -- is a resin formed by a condensation reaction between --. The change is made to properly characterize the resin used as the product of a reaction between constituent resins. Support is found in paragraph [0025] of the written specification.

ORIGINAL CLAIMS **42 – 59** ARE UNCHANGED.

ORIGINAL CLAIM **64** IS AMENDED AS FOLLOWS:

In original line 13 of the claim, the word -- and -- is ADDED AFTER the semicolon ending the clause. The change is made to correct the punctuation and syntax of the claim.

In original line 15 of the claim, the word “for” AFTER the words “a foam tool” are DELETED and REPLACED with the words -- capable of --. The change is made to better describe the invention. Support is found in line 1 of the Abstract and in TABLES 3 and 4 of the written description.

ORIGINAL CLAIM **65** IS UNCHANGED.

ORIGINAL CLAIM **66** IS AMENDED AS FOLLOWS:

In original line 1 of each claim, the word “composition” AFTER the words “comprising the” is DELETED and REPLACED with the words -- light-weight polyisocyanurate foam structure -- “. The change is made to comport each claim with the amendment to Claim 1 and to properly characterize the invention as the foam structure that results from reacting the claimed constituent materials together. Support is found in paragraphs [0021], [0022], [0024], and [0028] – [0034] of the written description, and in step (d) of original Claim 19.

ORIGINAL CLAIM **67** IS WITHDRAWN AND CANCELED.

Applicants assert that no new matter was included as the result of the foregoing amendment.

REJECTION UNDER 35 U.S.C. §112

Examiner's Remarks

Examiner has rejected Claims **1 – 18** and **3, 4, 41, and 42** under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement in that the claims recite subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. In particular the Examiner asserts that with regard to Claims **1 – 18**:

“Applicants' supporting disclosure provides no description of a lightweight polyisocyanurate foam composition which comprises an epoxide resin, an isocyanate resin, tertiary amine catalyst, and cyclic amine as claimed. Rather, applicants' disclosure is supportive of a polyisocyanurate foam composition resulting from the mixing and reacting the materials identified.”

And, with regard to Claims **3, 4, 41, and 42**:

“Applicants' supporting disclosure provides no description of a epoxide resin which is a mixture of bisphenol A or F and epichlorohydrin. Rather, applicants' disclosure is supportive of a epoxide resins which are the reaction product of bisphenol A or F and epichlorohydrin.”

Applicants' Response

Applicants wish to thank the Examiner for his remarks and for pointing out the discrepancy in the claims, as-filed. Applicants have therefore, amended Claims **1-18**, and **41** in order to properly claim the invention described in the written specification.

REJECTION UNDER 35 U.S.C. §103(a)

Examiner's Remarks

Claims 1-18, 39-59, and 64-67 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hayash, Jr. et al.(U.S. Patent Serial No. 3,673,128), alone, or in view of Fuzesi et al.(U.S. Patent Serial No.4,699,931) and/or Whinnery et al. TEPIC document (Whinnery et al.), in that:

“ Hayash, Jr. et al. discloses preparations of oxazolidone-modified isocyanurate foams prepared by mixing and reacting polyisocyanates and epoxide resins in the presence of catalysts, surfactants, blowing agents inclusive of water and other propellants, and additives (see abstract, column 2 line 10-column 8 line 50, as well as, the entire document). Hayash, Jr. et al. discloses combination of the epoxy resins and polyisocyanates in amounts meeting the ranges of combinational values set forth by applicants claims. Further, regarding the product-by-process recitations of applicants' claims, the resultant epoxy resin/polyisocyanate based foamed polymers of Hayash, Jr. et al. are of a formed structure having no apparent factually supported, non-obvious differences from the formed products of applicants' claims that burden is upon applicants' to demonstrate any unobvious differences in the product which may be evident based on the process recitations of the claims.

Hayash,Jr. et al. differs from applicants' claims in that combinations of tertiary amine catalysts inclusive of cyclic amines are not required or, specifically, blends of 2,4,6-tris(dimethylaminomethyl)phenol and N,N-dimethylcyclohexylamine and/or relative amounts values as claimed. However, Hayash, Jr. et al. (see column 7 lines 47 and 55) discloses employment of these compounds in the preparations of Hayash, Jr. et al. for the purpose of imparting their reaction catalyzing effects. Accordingly, it would have been obvious for one having ordinary skill in the art to have employed the disclosed 2,4,6-tris(dimethylaminomethyl)phenol and N,N-dimethylcyclohexylamine catalyst of Hayash, Jr. et al. in combinations of varied respective individual contents within the teachings of Hayash, Jr. et al. for the purpose of imparting their disclosed reaction catalyzing effects in order to arrive at the products of applicants' claims

with the expectation of success in the absence of a showing of new or unexpected results. Additionally, regarding the blending of the tertiary amine with the cyclic amine, it has been held that is prima facie obvious to combine two compositions, each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose. In re Kerkhoven 205 USPQ 1069. The idea for combining said compositions flows logically from their having been individually taught in the prior art. In re Crockett 126USPQ 186, 188. Relatedly, the fact that a first component is in no way related to the second component, but where each has the same utility, does not detract from the obviousness of combining them. In re Linder, 457 F.2d 506, 507 (CCPA 1972). (Holding that it would have been obvious to combine two known dispersants, since one skilled in the art would have expected a mixture of such dispersants to also be a dispersant).

Hayash, Jr. et al. differs from applicants' claims in that glycidyl ethers of Bisphenol A or F are not particularly required. However, Hayash, Jr. et al. indicates these materials to be acceptable members of one of the preferred groups of members used in the practice of their invention(see column 4 line 32-34 and column 6 lines 69- 70). Accordingly, it would have been obvious for one having ordinary skill in the art to have employed glycidyl ethers of Bisphenol A or F disclosed by Hayash,Jr. et al. in the making of the preparations of Hayash, Jr. et al. for the purpose of imparting their epoxy resin functional effect in order to arrive at the products of applicants' claims with the expectation of success in the absence of a showing of new or unexpected results. It is prima facie obvious to substitute equivalents, motivated by the reasonable expectation that the respective species will behave in a comparable manner or give comparable results in comparable circumstances. In re Ruff 118 USPQ 343; In re Jeze/158 USPQ 99; the express suggestion to substitute one equivalent for another need not be present to render the substitution obvious. In re Font, 213 USPQ 532. Additionally, though epichlorohydrin is not particularly recited to be the species used in the glycidylation of the polynuclear phenols of Hayash, Jr. et al. such is not seen to be a point of distinction as Hayash, Jr. et al. recites their materials to be glycidyl ethers and difference based on the formed epoxy resin is not seen or demonstrated in fact. Regardless, column 5 lines 3-5 of Hayash, Jr. et al.

demonstrates epichlorohydrin to be a conventional means of converting non-fused phenols to glycidyl ethers. Accordingly, employment of this species in the making of the Bisphenol glycidyl ethers of Hayash, Jr. et al. with the expectation of success in the absence of a showing of new or unexpected results.

Hayash, Jr. et al. further differs from applicants' claims in that additives as claimed are not particularly employed. However, Hayash, Jr. et al. does disclose the employment of additives in their preparations (column 8 lines 37-40), and Fusezi et al. (see column 11 line 63 - column 12 line 2) and Whinnery et al. (pages 8-10) disclose the employment of various fillers inclusive of the inorganic and organic fillers, acrylonitrile copolymers, and glass microbeads of applicants' claims in the making of closely related foam preparations for the purpose of imparting their bulking and strengthening effects. Accordingly, it would have been obvious for one having ordinary skill in the art to have employed the additive/filler materials of Fusezi et al. and Whinnery et al. in the preparations of Hayash, Jr. et al. for the purpose of imparting their bulking and strengthening effects in order to arrive at the products of applicants' claims with the expectation of success in the absence of a showing of new or unexpected results."

Applicants' Response

Applicants wish to thank the Examiner for his remarks but respectfully disagree with his both his remarks and his conclusion regarding Claims 1-18, 39-59, and 64-67.

1. With regard to Claim 1, Applicants note that, notwithstanding the Examiner's assertion that Hayash, Jr. et al., ('128) discloses "*foams prepared by mixing and reacting polyisocyanates and epoxide resins in the presence of catalysts*," (emphasis added) Applicants note that Hayash, Jr., et al. does not describe foams prepared by mixing and reacting polyisocyanates and epoxide resins in the presence of "... a tertiary amine catalyst; and a cyclic amine" as do they. Furthermore, Hayash, Jr., et al. claims only a mixture prepared in the presence of "... a tertiary amine catalyst" (rather than "catalysts") and does so using the closed claim language "... consisting essentially of." Furthermore, neither Fuzesi, et al., ('931) nor Whinnery, et al. (TEPIC) suggest or teach using both a tertiary and a cyclic amine to catalyze a polyisocyanurate polymerization reaction. As with Hayash, Jr., et al., Fuzesi, et

al., recite an extensive list of possible amine catalysts. However, Fuzesi, et al., never suggest (either explicitly or inherently) the specific combination of the instant invention. Moreover, Whinnery, et al., teaches to use only the TMR-3 catalyst and does not recite or suggest use of a cyclic amine co-catalyst.

Applicants note that while Hayash, Jr., et al. and Fuzesi, et al., do suggest that it may be advantageous to use a mixture of an amine catalyst and an organometallic catalyst (col. 7, line 67 and col. 10, line 1, respectively) absolutely nothing in either Hayash, Jr., et al., or Fuzesi, et al., teach or suggest the use of the two amine co-catalysts disclosed by the Applicants. Moreover, as the Applicants describe in their written description at paragraphs [0032] – [0033] the use of the second co-catalyst was found to be central to practicing their invention since, as was described by Whinnery, et al., the polymerization reaction between the urethane and epoxide resins could not be controlled once the water blowing agent was added initiated by a single amine catalyst. However, as is described by the present invention this same reaction can be controlled when the second cyclic amine co-catalyst is introduced together with the first tertiary amine catalyst.

Regarding the Examiner's assertion that blending the disclosed tertiary amine with the cyclic amine “... *has been held that is prima facie obvious to combine two compositions, each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose. In re Kerkhoven 205 USPQ 1069 ...*” and “... *the fact that a first component is in no way related to the second component, but where each has the same utility, does not detract from the obviousness of combining them. In re Linder, 457 F.2d 506, 507 (CCPA 1972). (Holding that it would have been obvious to combine two known dispersants, since one skilled in the art would have expected a mixture of such dispersants to also be a dispersant).*” Applicants note that they are not claiming to form a third amine catalyst as would be necessary if the logic and meaning of Kerkhoven or Lindner were to apply. Both Kerkhoven and Lindner claimed to combine a known constituents A and B, both of which were used for a particular known purpose, in order to provide a third constituent which is also to be used for the same purpose as the initial constituent materials. The former claimed a new detergent, while the latter claimed a dispersant. However, Applicants have

instead claimed the reaction product formed between an isocyanurate and an epoxide resin and not a new mixed amine catalyst.

Finally, Applicants notes the Examiner's argument that "...*The idea for combining said compositions flows logically from their having been individually taught in the prior art. In re Crockett 126USPQ 186, 188*" is assumed to mean "individually taught in the prior art" in order to provide a particular function or purpose. Crockett claimed adding known constituents A and B, both of which were separately known to be used to produce the same particular effect in a third material (forming carbon nodules in a bath of molten iron). While this reasoning would seem to parallel the present claims, Applicants assert that it is quite different. In particular, the constituents used by Crockett each functioned properly to produce the intended effect when used separately as well as when used in combination. However, in the present case, when only one of the constituent catalysts is used (e.g. the tertiary amine) with water as a blowing agent, the foam-forming reaction was found to proceed far too rapidly such that the foam quickly rose and then collapsed followed by only partial polymerization. That is, the use of the catalysts separately did not provide the intended end product. Instead it was found that the combination of the tertiary amine and the cyclic amine catalyst was a necessary condition to provide the desired end reaction product.

An affidavit under 37 C.F.R. §1.132 is included as an Appendix to this reply attesting to the behavior of the catalysts.

Therefore, Applicants respectfully traverse the Examiner's use of Kerkhoven, Lindner, and Crockett and assert that they are misapplied. Moreover, Applicants respectfully traverse the Examiner's rejection reaction mixture of Claim 1 under 35 U.S.C. §103(a) because none of Hayash, Jr., et al. ('128), Fuzesi, et al., ('931), or Whinnery, et al. (TEPIC) either separately, or in combination provided a sufficient basis to find the present invention since none teach or disclose adding "... a tertiary amine and a cyclic amine." That is, not all of the limitations of the instant claim can be found in the prior art as is required by MPEP §2143.

Consequently, Applicants respectfully assert that the Examiner has not met his burden for maintaining a case for *prima facie* obviousness and that they, therefore, have overcome the rejection under 35 U.S.C. §103(a) with respect to Claim 1. The Applicants, therefore, respectfully request that the Examiner reconsider and withdraw his rejection reaction mixture of claim 1 and pass this claim to allowance.

With regard to Claims 2 – 18 and 66, Applicants note that all of the prior arguments used to rebut the argument of obviousness in Claim 1 apply equally to Claims 2 – 18 and 66 since each of these claims ultimately depends from Claim 1, and must, by definition, necessarily narrow the scope of the parent claim. Consequently, Applicants assert that they have overcome the rejection under 35 U.S.C. §103(a) with respect to Claims 2 – 18 and 66 in that they have removed the grounds for their rejection in that not all of the limitations of these claims can be found in the prior art. The Applicants, therefore, respectfully request that the Examiner reconsider and withdraw his rejection reaction mixture of claims 2 – 18 and 66 and pass these claims to allowance.

2. With regard to Claims 39 and 64, Applicants note that, notwithstanding the Examiner's assertion that “... *the resultant epoxy resin/polyisocyanate based foamed polymers of Hayash, Jr. et al. are of a formed structure having no apparent factually supported, non-obvious differences from the formed products of applicants' claims* ...” Applicants note that their claim explicitly recite a foam structure “... capable of sustaining prolonged exposure to temperatures up to about 200°C while also maintaining a mechanical compressive strength of at least 25 MPa” (emphasis added). Since 25MPa converts to 3625 psi and because neither Hayash, Jr., et al. nor Fuzesi, et al. teach or suggest foam structures having compressive strengths above about 45 psi (310 kPa) (see TABLES I and III in cols. 10 and 11 in Hayash, Jr. et al., and TABLE I below cols. 13 and 14 in Fuzesi, et al.), it is clear that the present invention describes a structure having a compressive strength nearly two orders of magnitude greater than that of the prior art. As such, Applicants assert that their product-by-process claims do, in fact, demonstrate a factually supported (see TABLES 3 and 4), and non-obvious difference not found in the prior art.

Consequently, Applicants respectfully assert that the Examiner has not met his burden for maintaining a case for *prima facie* obviousness and that they, therefore, have overcome the rejection under 35 U.S.C. §103(a) with respect to Claims 39 and 64. The Applicants, therefore, respectfully request that the Examiner reconsider and withdraw his rejection of Claims 39 and 64 and pass this claim to allowance.

Furthermore, with regard to Claims 40 – 59, and 65, Applicants note that all of the prior arguments used to rebut the argument of obviousness in Claims 39 and 64 apply equally to Claims 40 – 59 and 65 since each of these claims ultimately depends from Claims 39 and 65 and must, by definition, necessarily narrow the scope of the parent claim. Consequently, Applicants assert that they have overcome the rejection under 35 U.S.C. §103(a) with respect to Claims 40 – 59, and 65 in that they have removed the grounds for their rejection in that not all of the limitations of these claims can be found in the prior art. The Applicants, therefore, respectfully request that the Examiner reconsider and withdraw his rejection of Claims 40 – 59, and 65 and pass these claims to allowance.

3. With regard to product-by process Claim 67, Applicants note that this claim depends from a non-elected claim, now canceled. Applicants, therefore, respectfully request that this claim be withdrawn and canceled without prejudice.

Therefore, by canceling claim 67, Applicants assert that they have removed the grounds for this rejection and respectfully request that the Examiner reconsider and withdraw his rejection in this claims and to pass the remaining claims to allowance.

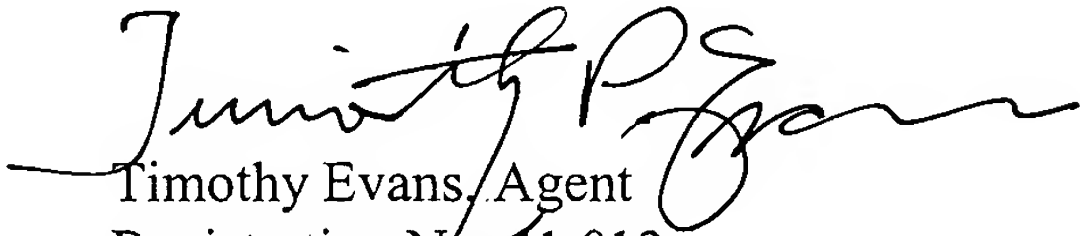
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CONCLUSION

Applicants respectfully assert that the instant invention claims unique structure that are neither anticipated, nor suggested by the prior art. Applicants, therefore, respectfully request reconsideration of the claims now presented and earnestly solicits allowance of this application.

This response is:

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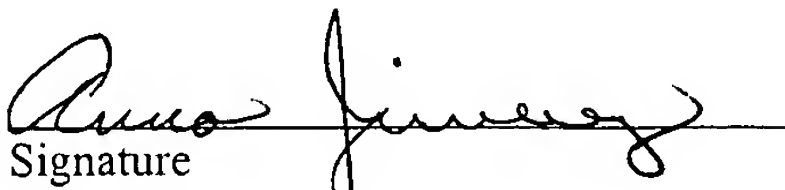
CERTIFICATION UNDER 37 CFR 1.8

I hereby certify that this Response and Amendment and any documents referred to as being attached thereto are being deposited with the U. S. Postal Service as FIRST CLASS mail addressed to: Mail Stop Non Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450

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